IN THE CLAIMS:

Please amend 7-9, 18, 20, 29 and 31 as follows.

Claims 1-6.   (Cancelled).

7.   (Currently Amended) A method of rendering an expression tree into a raster pixel image having a plurality of pixel locations, the expression tree having a plurality of nodes comprising one or more binary nodes and a plurality of leaf nodes, wherein each binary node has a left branch to a descendent node and a right branch to another descendent node and represents a binary operation on the two ~~descendant~~ descendent nodes, and wherein each node represents a graphic object having object edges, with one or more of the graphic objects overlapping, the overlapping ~~graphics~~ graphic objects comprising a left node region, a common region, and a right node region, said method comprising the steps of:

determining groups of one or more pixel locations, wherein the groups are bounded by the object edges;

determining, for each group, whether the left and right branches of the one or more binary nodes are active or inactive; and

traversing, for each group, the expression tree, wherein said traversing step comprises the substeps of:

checking whether the right and left branches of a previously traversed binary node are active or a left node region is required for the binary operation of the previously

traversed binary node and the left branch is active and the right branch is inactive of the previously traversed binary node, and if so, traversing the left branch of the previously traversed binary node to the descendent node; and

checking whether the right and left branches of the previously traversed binary node are active or a right node region is required for the binary operation of the previously traversed binary node and the right branch is active and the left branch is inactive of the previously traversed binary node, and if so, traversing the right branch of the previously traversed binary node to the descendent node;

generating, for each group, operator instructions for any binary node traversed in said traversing step and having active right and left branches;

generating, for each group, leaf value instructions for any leaf node traversed in said traversing step; and

executing for each group, the generated instructions to render the graphic objects <u>for reproduction on a reproduction device</u> at the one or more pixel locations.

8.   (Currently Amended) A method according to claim 7, wherein said traversing step traverses the expression tree, wherein the left branch of any previously traversed <u>binary node is traversed to its</u> descendent node if the right and left branches of the previously traversed binary node are active and if the graphic object representing the descendent node on the right branch of the previously traversed binary node does not obscure the graphic object representing the descendent node on the left branch of the previously traversed binary node in the

common region of the graphic objects representing the descendent nodes of the previously

traversed binary node, and wherein the right branch of any previously traversed binary node is

traversed to its descendent node if the right and left branches of the previously traversed binary

node are active and if the graphic object representing the descendent node on the left branch of

the previously traversed binary node does not obscure the graphic object representing the

descendent node on the right branch of the previously traversed binary node in the common

region of the graphic objects representing the descendent nodes of the previously traversed binary

node.

9.   (Currently Amended) A method of rendering an expression tree into a

raster pixel image having a plurality of scanlines and a plurality of pixel locations on each

scanline, the expression tree having a plurality of nodes comprising one or more binary nodes

and a plurality of leaf nodes, wherein each binary node has a left branch to a descendent node and

a right branch to another descendent node and represents a binary operation on the two

~~descendant~~ descendent nodes, and wherein each node represents a graphic object having object

edges, with one or more graphic objects overlapping, the overlapping ~~graphics~~ graphic objects

comprising a left node region, a common region, and a right node region, said method

comprising the steps of:

generating a table representative of the expression tree, wherein the

table comprises a plurality of records corresponding to associated binary nodes and leaf nodes,

and each record of an associated binary node comprises a first field indicating whether a left node

region is required for operation of the operator of the associated binary node, a second field indicating whether a right <u>node</u> region is required for operation of the operator of the associated binary node, a third field capable of indicating whether a left branch of the associated binary node is active, and a fourth field capable of indicating whether a right branch of the associated binary node is active;

determining groups of one or more pixel locations, wherein the groups are bounded by object edges;

determining, for each group, whether the left and right branches of the one or more binary nodes are active or inactive;

updating, for each group, the third and fourth fields of the table for the determined active and inactive branches;

traversing, for each group, the expression tree in accordance with the updated table wherein said traversing step comprises the substeps of:

checking whether the right and left branches of a previously traversed binary node are active or a left node region is required for the binary operation of said previously traversed binary node and the left branch is active and the right branch is inactive of the previously traversed binary node and, if so, traversing the left branch of the previously traversed binary node to the descendent node; and

checking whether the right and left branches of the previously traversed binary node are active or a right node region is required for the binary operation of the previously traversed binary node and the right branch is active and the left branch is inactive of the

previously traversed binary node and, if so, traversing the right branch of the previously traversed

binary node to the ~~descending~~ <u>descendent</u> node;

generating, for each group, operator instructions for any traversed

binary node having active said right and left branches, and leaf value instructions for any

traversed leaf node; and

executing, for each group, corresponding generated instructions so as to

render the image <u>for reproduction on a reproduction device</u>.

10.   (Previously Presented) A method according to claim 9,

wherein the table further comprises for each record of an associated

binary node a fifth field indicating whether the graphic object representing the descendent node

on the right branch of the associated binary node obscures the graphic object representing the

descendent node on the left branch of the associated binary node in the common region of the

graphic objects representing the descendent nodes of the associated binary node, and a sixth field

indicating whether the graphic object representing the descendent node on the left branch of the

associated binary node obscures the graphic object representing the descendent node on the right

branch of the associated binary node in the common region of the graphic objects representing

the descendent nodes of the associated binary node, and

wherein said traversing step traverses the expression tree in accordance

with the updated table, wherein the left branch of any previously traversed binary node is

traversed to its descendent node if the right and left branches of the previously traversed binary

node are active and if the graphic object representing the descendent node on the right branch of

the previously traversed binary node does not obscure the graphic object representing the

descendent node on the left branch of the previously traversed binary node in the common region

of the graphic objects representing the descendent nodes of the previously traversed binary node,

and wherein the right branch of any previously traversed binary node is traversed to its

descendent node if the right and left branches of the previously traversed binary node are active

and if the graphic object representing the descendent node on the left branch of the previously

traversed binary node does not obscure the graphic object representing the descendent node on

the right branch of the previously traversed binary node in the common region of the graphic

objects representing the descendent nodes of the previously traversed binary node.

11.   (Previously Presented) A method according to claim 10, wherein the

fifth and sixth fields are used to implement a CLIP IN or a CLIP OUT operation.

Claims 12-17.   (Cancelled).

18.   (Currently Amended) An apparatus for rendering an expression tree

into a raster pixel image having a plurality of pixel locations, the expression tree having a

plurality of nodes comprising one or more binary nodes and a plurality of leaf nodes, wherein

each binary node has a left branch to a descendent node and a right branch to another descendent

node and represents a binary operation on the two ~~descendant~~ descendent nodes, and wherein

each node represents a graphic object having object edges, with one or more graphic objects overlapping, the overlapping ~~graphics~~ graphic objects comprising a left node region, a common region, and a right node region, said apparatus comprising:

means for determining groups of one or more pixel locations, wherein the groups are bounded by the object edges;

means for determining, for each group, whether the left and right branches of one or more binary nodes are active or inactive;

means for traversing, for each group, the expression tree, wherein said means for traversing comprises:

means for checking whether the right and left branches of a previously traversed binary node are active or a left node region is required for the binary operation of the previously traversed binary node and the left branch is active and the right branch is inactive of the previously traversed binary node and, if so, traversing the left branch of the previously traversed binary node to the descendent node; and

means for checking whether the right and left branches of the previously traversed binary node are active or a right node region is required for the binary operation of the previously traversed binary node and the right branch is active and the left branch is inactive of the previously traversed binary node and, if so, traversing the right branch of the previously traversed binary node to the descendent node;

means for generating, for each group, operator instructions for any binary node traversed by said traversing means and having active right and left branches,

means for generating, for each group, leaf value instructions for any leaf node traversed by said traversing means; and

means for executing, for each group, the generated instructions to render the graphic objects at the one or more pixel locations.

19. (Previously Presented) An apparatus according to claim 18, wherein said traversing means traverses the expression tree, wherein the left branch of any previously traversed said binary node is traversed to its descendent node if the right and left branches of the previously traversed binary node are active and if the graphic object representing the descendent node on the right branch of the previously traversed binary node does not obscure the graphic object representing the descendent node on the left branch of the previously traversed binary node in the common region of the graphic objects representing the descendent nodes of the previously traversed binary node, and wherein the right branch of any previously traversed binary node is traversed to its descendent node if the right and left branches of the previously traversed binary node are active and if the graphic object representing the descendent node on the left branch of the previously traversed binary node does not obscure the graphic object representing the descendent node on the right branch of the previously traversed binary node in the common region of the graphic objects representing the descendent nodes of the previously traversed binary node.

20. (Currently Amended) An apparatus for rendering an expression tree into a raster pixel image having a plurality of scanlines and a plurality of pixel locations on each scanline, the expression tree having a plurality of nodes comprising one or more binary nodes and a plurality of leaf nodes, wherein each binary node has a left branch to a descendent node and a right branch to another descendent node and represents a binary operation on the two ~~descendant~~ descendent nodes, and wherein each node represents a graphic object having object edges, with one or more graphic objects overlapping, the overlapping ~~graphics~~ graphic objects comprising a left node region, a common region, and a right node region, said apparatus comprising:

means for generating a table representative of the expression tree, wherein the table comprises a plurality of records corresponding to associated binary nodes and leaf nodes, and each record of an associated binary node comprises a first field indicating whether a left node region is required for operation of the operator of the associated binary node, a second field indicating whether a right node region is required for operation of the operator of the associated binary node, a third field capable of indicating whether a left branch of the associated binary node is active, and a fourth field capable of indicating whether a right branch of the associated binary node is active;

means for determining groups of one or more pixel locations, wherein the groups are bounded by the object edges;

means for determining, for each group, whether the left and right branches of the one or more binary nodes are active or inactive;

means for updating, for each group, the third and fourth fields of the table for the determined active and inactive branches;

means for traversing, for each group, the expression tree in accordance with the updated table wherein said means for traversing comprises:

means for checking whether the right and left branches of a previously traversed binary node are active or a left node region is required for the binary operation of the previously traversed binary node and the left branch is active and the right branch is inactive of the previously traversed binary node and, if so, traversing the left branch of the previously traversed binary node to the descendent node; and

means for checking whether the right and left branches of the previously traversed binary node are active or a right node region is required for the binary operation of the previously traversed binary node and the right branch is active and the left branch is inactive of the previously traversed binary node and, if so, traversing the right branch of the previously traversed node to the descendent node;

means for generating, for each group, operator instructions for any traversed binary node having active right and left branches, and leaf value instructions for any traversed leaf node; and

means for executing, for each group, corresponding generated instructions so as to render the image.

21.   (Previously Presented) An apparatus according to claim 20,

wherein the table further comprises for each record of an associated binary node a fifth field indicating whether the graphic object representing the descendent node on the right branch of the associated binary node obscures the graphic object representing the descendent node on the left branch of the associated binary node in the common region of the graphic objects representing the descendent nodes of the associated binary node, and a sixth field indicating whether the graphic object representing the descendent node on the left branch of the associated binary node obscures the graphic object representing the descendent node on the right branch of the associated binary node in the common region of the graphic objects representing the descendent nodes of the associated binary node, and

wherein said traversing means traverses the expression tree in accordance with the updated table, wherein the left branch of any previously traversed binary node is traversed to its descendent node if the right and left branches of the previously traversed binary node are active and if the graphic object representing the descendent node on the right branch of the previously traversed binary node does not obscure the graphic object representing the descendent node on the left branch of the previously traversed binary node in the common region of the graphic objects representing the descendent nodes of the previously traversed binary node, and wherein the right branch of any previously traversed binary node is traversed to its descendent node if the right and left branches of the previously traversed binary node are active and if the graphic object representing the descendent node on the left branch of the previously traversed binary node does not obscure the graphic object representing the descendent node on

the right branch of the previously traversed binary node in the common region of the graphic

objects representing the descendent nodes of the previously traversed binary node.

22.   (Previously Presented) An apparatus according to claim 21, wherein

the fifth and sixth fields are used to implement a CLIP IN or a CLIP OUT operation.

Claims 23-28.   (Cancelled).

29.   (Currently Amended) A computer readable medium comprising a

computer program for rendering an expression tree into a raster pixel image having a plurality of

pixel locations, the expression tree having a plurality of nodes comprising one or more binary

nodes and a plurality of leaf nodes, wherein each binary node has a left branch to a descendent

node and a right branch to another descendent node and represents a binary operation on the two

~~descendant~~ descendent nodes, and wherein each node represents a graphic object having object

edges, with one or more graphic objects overlapping, the overlapping ~~graphics~~ graphic objects

comprising a left node region, a common region, and a right node region, said computer program

comprising:

code for determining groups of one or more pixel locations, wherein the

groups are bounded by the object edges;

code for determining, for each group, whether the left and right

branches of the one or more binary nodes are active or inactive;

code for traversing, for each group, the expression tree, wherein said code for traversing comprises:

code for checking whether the right and left branches of a previously traversed binary node are active or a left node region is required for the binary operation of the previously traversed binary node and the left branch is active and the right branch is inactive of the previously traversed binary node and, if so, traversing the left branch of the previously traversed binary node to the descendent node; and

code for checking whether the right and left branches of the previously traversed binary node are active or a right node region is required for the binary operation of the previously traversed binary node and the right branch is active and the left branch is inactive of the previously traversed binary node and, if so, traversing the right branch of the previously traversed binary node to the descendent node;

code for generating, for each group, operator instructions for any binary node traversed by said code for traversing and having active right and left branches,

code for ~~checking~~ generating, for each group, leaf value instructions for any leaf node traversed by said code for traversing; and

code for executing, for each group, the generated instructions to render the graphic objects for reproduction on a reproduction device at the one or more pixel locations.

30.   (Previously Presented) A computer readable medium according to claim 29, wherein said traversing code traverses the expression tree, wherein the left branch of

any previously traversed binary node is traversed to its descendent node if the right and left branches of the previously traversed binary node are active and if the graphic object representing the descendent node on the right branch of the previously traversed binary node does not obscure the graphic object representing the descendent node on the left branch of the previously traversed binary node in the common region of the graphic objects representing the descendent nodes of the previously traversed binary node, and wherein the right branch of any previously traversed binary node is traversed to its descendent node if the right and left branches of the previously traversed binary node are active and if the graphic object representing the descendent node on the left branch of the previously traversed binary node does not obscure the graphic object representing the descendent node on the right branch of the previously traversed binary node in the common region of the graphic objects representing the descendent nodes of the previously traversed binary node.

31. (Currently Amended) A computer readable medium comprising a computer program for rendering an expression tree into a raster pixel image having a plurality of scanlines and a plurality of pixel locations on each scanline, the expression tree having a plurality of nodes comprising one or more binary nodes and a plurality of leaf nodes, wherein each binary node has a left branch to a descendent node and a right branch to another descendent node and represents a binary operation on the two ~~descendant~~ descendent nodes, and wherein each node represents a graphic object having object edges, with one or more graphic objects overlapping,

the overlapping ~~graphics~~ graphic objects comprising a left node region, a common region, and a right node region, said computer program comprising:

code for generating a table representative of the expression tree, wherein the table comprises a plurality of records corresponding to associated binary nodes and leaf nodes, and each record of an associated binary node comprises a first field indicating whether a left node region is required for operation of the operator of the associated binary node, a second field indicating whether a right node region is required for operation of the operator of the associated binary node, a third field capable of indicating whether a left branch of the associated binary node is active, and a fourth field capable of indicating whether a right branch of the associated binary node is active;

code for determining groups of one or more pixel locations, wherein the groups are bounded by the object edges;

code for determining, for each group, whether the left and right branches of the one or more binary nodes are active or inactive;

code for updating, for each group, the third and fourth fields of the table for the determined active and inactive branches;

code for traversing, for each group, the expression tree in accordance with the updated table wherein said code for traversing comprises:

code for checking whether the right and left branches of a previously traversed binary node are active or a left node region is required for the binary operation of the previously traversed binary node and the left branch is active and the right branch is inactive of

the previously traversed binary node and, if so, traversing the left branch of the previously

traversed binary node to the descendent node; and

code for checking whether the right and left branches of the previously

traversed binary node are active or a right node region is required for the binary operation of the

previously traversed binary node and the right branch is active and the left branch is inactive of

the previously traversed binary node and, if so, traversing the right branch of the previously

traversed binary node to the descendent node;

code for generating, for each group, operator instructions for any

traversed binary node having active right and left branches, and leaf value instructions for any

traversed leaf node; and

code for executing, for each group, corresponding generated

instructions so as to render the image for reproduction on a reproduction device.

32.   (Previously Presented) A computer readable medium according to

claim 31, wherein the table further comprises for each record of an associated binary node a fifth

field indicating whether the graphic object representing the descendent node on the right branch

of the associated binary node obscures the graphic object representing the descendent node on the

left branch of the associated binary node in the common region of the graphic objects

representing the descendent nodes of the associated binary node, and a sixth field indicating

whether the graphic object representing the descendent node on the left branch of the associated

binary node obscures the graphic object representing the descendent node on the right branch of

the associated binary node in the common region of the graphic objects representing the descendent nodes of the associated binary node, and

wherein said traversing means traverses the expression tree in accordance with the updated table, wherein the left branch of any previously traversed binary node is traversed to its descendent node if the right and left branches of the previously traversed binary node are active and if the graphic object representing the descendent node on the right branch of the previously traversed binary node does not obscure the graphic object representing the descendent node on the left branch of the previously traversed binary node in the common region of the graphic objects representing the descendent nodes of the previously traversed binary node, and wherein the right branch of any previously traversed binary node is traversed to its descendent node if the right and left branches of the previously traversed binary node are active and if the graphic object representing the descendent node on the left branch of the previously traversed binary node does not obscure the graphic object representing the descendent node on the right branch of the previously traversed binary node in the common region of the graphic objects representing the descendent nodes of the previously traversed binary node.

33.   (Previously Presented) A computer program according to claim 32, wherein the fifth and sixth fields are used to implement a CLIP IN or a CLIP OUT operation.